After his return to reside in London he found the duties of the office he had undertaken so engrossing, and the cares of domestic life so exacting, as to leave him little or no spare time for original inquiry. He devoted such leisure as he could command to translating, editing, and other scientific labour of a literary kind. Biologists will especially remember the appearance of his translation of Fritz Müller's "Facts and Arguments for Darwin," shortly after the beginning of the controversy aroused by "The Origin of Species." His wide range of knowledge in natural science, and his literary tact and experience, made him an unrivalled editor of a scientific periodical. The volumes of *The Quarterly Journal of the Geological Society* for the last twenty years will remain as a memorial of the accuracy, skill, and punctuality of his work. It will be difficult to find another assistant secretary so deft and helpful as he: it will be, however, still harder to discover one who to ample scientific acquirements and long experience will unite a nature so gentle and kindly as his, and a character so honourable and sincere. Mr. Dallas may be said to have died in harness. Though for some time he had been growing gradually feebler, he attended the evening meeting of the Geological Society only a fortnight ago. But the hand of death was then visibly upon him. Two days afterwards he was struck down with paralysis, and, after lingering a week, died on the morning of May 28, at the age of sixty-six. Last Monday his associates of the Geological Society laid him in his grave in the Norwood Cemetery. A. G.

NOTES.

Besides the death of Mr. W. S. Dallas, the Assistant-Secretary of the Geological Society, the ranks of the geologists of this country were further thinned last week by the loss of another well-known and most esteemed student of geology—Mr. John Gunn, of Norwich. Though not distinguished as a writer on geological subjects, he has long been looked up to as the chief authority on that most interesting deposit—the Cromer Forest-bed; and as the most indefatigable and successful collector of its organic contents. He had, moreover, an extensive knowledge of all the geological formations of East Anglia. He was, likewise, fond of antiquarian researches, and in early life did good service among the archæological and ecclesiastical antiquities of his county. But while always eagerly seeking fresh information and gathering a vast store of facts in many departments of inquiry, he refrained from rushing frequently into print, while on the other hand, with generous self-abnegation, he was ever ready to place his materials at the service of science and the public. Every honest inquirer was always welcome to any information or assistance he could give. After amassing a magnificent suite of fossils, illustrating especially the mammalian life of Pliocene time in England, he presented it to the Norfolk and Norwich Museum, where it forms one of the most attractive and instructive features of the collection, and fills what is called after him the "Gunn Room." Mr. Gunn had reached his eighty-ninth year.

We are glad to gather from the statement made in the House of Commons on May 22 by Sir John Gorst, in reply to a question from Sir Henry Roscoe, that the new regulations which will shortly be issued by the Civil Service Commission for the competitions for admission to the higher branch of the Indian Civil Service are, in the opinion of Sir John Gorst, likely to satisfy the desire which is widely felt at the Universities and elsewhere that they "shall secure more equal prospects of success for those whose chief studies have been in science than are at present accorded in these competitions." Those who are interested in this important educational question will be glad that Sir Henry Roscoe has directed the attention of the authorities at the India Office to this matter, and they will hope that if the new regulations are not found to satisfy the necessities of the case, he will continue his exertions. We do not wish to be prophets of evil, but experience unfortunately shows that the Civil Service Commissioners are by no means likely to put science subjects on anything like a fairly equal footing with classics except under considerable pressure from public opinion. It will therefore be important that prompt combined action shall be taken in support of Sir Henry Roscoe by those who have interested themselves in the question, if the new regulations do not prove to be of a satisfactory character. If the present opportunity of securing that the conditions of admission to this important service be put on a proper footing be lost, it may be long before another occurs. Such action has, however, succeeded in other cases, and ought to do so in this case also.

In moving the Education Estimates on Tuesday evening, Sir W. Hart Dyke gave an elaborate and most careful account of the new Code, the leading provisions of which we have already discussed. Among the speakers who took part in the subsequent debate or conversation was Sir Henry Roscoe, who congratulated the Vice-President on having for the first time carried out some of the recommendations of the Royal Commission on which he had had the honour to serve. He welcomed the proposal to give a grant for manual instruction. He was also pleased to learn that the Vice-President took to heart one of the recommendations which laid the foundation for technical instruction—a foundation which many of them for a long time had hoped would be laid. It was gratifying to learn that already great progress had been made in several of the larger towns with regard to technical instruction. He hoped that the question of drawing would progress. He thought the specialization of science ought not to be made before the fourth standard. The question of training teachers was one which referred to probably the most important portion of the Code. He welcomed all that it was proposed to do. He believed that the new Code would mark an era in the educational progress of the country. Mr. Mundella, in the course of a short speech, said he had risen only to express his thanks to the Vice-President of the Council for the liberal provisions of his Code. He regretted, however, that these provisions had not been somewhat extended. Why had the Vice-President not gone somewhat further with respect to the recommendations of the Royal Commission as to raising the standard of age, and extending the school life of the child? They might make the best and most liberal arrangements for education, but if the child's school life was to end at ten years of age, they were wasting their money. In large towns there were thousands of children who went to full-time labour after the fourth standard. In many rural districts, especially in the west, the second standard was the half-time standard, and two years ago that had been the case in Bradford. Why could not the right hon. gentleman screw up his courage and adopt the recommendation of the Royal Commission, and do for England what was done in Scotland? They should have a minimum standard for half-time. He hoped that later on the right hon. gentleman would be able to announce that he had made some provision for meeting the suggestions which had been offered with regard to raising the age at which the school life of the child should end, and raising the full and half-time standards.

A Deputy Linacre Professor of Human and Comparative Anatomy is to be appointed at Oxford. He will hold office during the continuance of Prof. Moseley's illness. Candidates must send in their applications on or before June 21.

Good progress has been made with the arrangements for the fifty-eighth annual meeting of the British Medical Association, under the presidency of Dr. W. F. Wade, senior physician to the Birmingham General Hospital, to be held in Birmingham on July 29, 30, and 31, and August 1 next. There will be three addresses—an address in medicine, by Sir W. Foster, M.D., M.P., of Birmingham; an address in surgery, by Mr. Lawson Tait, of Birmingham; and an address in therapeutics, by Dr. William Henry Broadbent, of London. The scientific part of the meeting will be carried on in twelve sections. It is now fifty-six years since the Association first held its meeting at Birmingham.

At a meeting of the London Committee of the Edinburgh Exhibition on Tuesday, Mr. S. Lee Bapty, the general manager of the Exhibition, said the visitors during the first month had numbered 470,000. This was largely in excess of his most sanguine anticipations, and was all the more remarkable considering the state of the weather during most of the month. If the same number of visitors continued each month till October, there would be a total of over four millions. A very important exhibit of electrical appliances from forty manufacturers in France had just arrived, and these would be on view at the time of the approaching visit of the Lord Mayor and Sheriffs of London to Edinburgh.

At the meeting of the Society of Arts on May 15, Mr. C. Washington Eves read a valuable paper on Jamaica and its forthcoming Exhibition. Apparently there is good hope that the Exhibition will be a decided success. The exhibits will be divided into six groups—raw materials; implements for obtaining raw materials; machines and processes used in preparing and making up the raw materials into finished products; manufactured goods; educational appliances; fine arts, literature, and science. The section devoted to science will include maps and charts of the West Indies, and objects relating to engineering, sanitation, gas, electricity, astronomy, and anthropology. After the reading of the paper there was a discussion, in the course of which Mr. Morris, of Kew, said there was every indication that makers of machinery and others would send out appliances, and there was but little doubt that immense good would result to the island from the Exhibition.

The last Friday evening discourse at the Royal Institution will be given on June 13, by Prof. Silvanus P. Thompson. The subject will be "The Physical Foundation of Music."

The authorities of Wadham College, Oxford, announce that in the election to one of several exhibitions which are open to competition preference will be given to any candidate who shall undertake to read for honours in natural science from the time of his admission into College, and to proceed to a degree in medicine in the University of Oxford.

The *American Naturalist* states that the Marine Biological Laboratory at Boston, U.S.A., has issued a satisfactory annual report. The laboratory was crowded last summer, and the trustees appeal for donations to the amount of 7000 dollars for additions to the building, an increase in the library, and a steam-launch.

The Botanical Society of Regensburg—one of the oldest societies of the kind in Germany—celebrated its hundredth anniversary on May 15.

The late Herr M. Winkler, of Görlitz, has bequeathed his fine herbarium, comprising 150,000 specimens, and his botanical library, to the Botanical Garden at Breslau.

The members of the German and Austrian Alpine Club have elected a scientific committee, consisting of Prof. Penik, Vienna, Dr. Finsterwalder, Munich, Councillor Hann, Vienna, Prof. Partsch, Breslau, and Prof. Richter, Graz. This committee will investigate scientific questions relating to the Alps, devoting especial attention to glaciers and mountain streams. The results will be made known in the official publications of the Club.

The new Zoological Garden and Park at Rock Creek, Washington, to which we referred the other day, will be under the direction of Mr. W. T. Hornaday. It is stated that Prof. Frank Baker will be prosector, and will have charge of the department of comparative anatomy in the United States National Museum.

Telegrams received at New York on June 3 stated that shocks of earthquake had been felt at Lima on the previous morning. The earthquake was one of the severest that had been experienced there for years. There were three distinct shocks.

We learn from *Science* that the *Princess Louise*, which arrived at Victoria, B.C., from Skidegate and way ports, on the evening of April 24, brought news that on February 24 an earthquake shock was felt on all the islands around Skidegate, especially on the west coast of Queen Charlotte Islands, where a few old shanties were levelled to the ground. The totem-poles of the Indians shook like leaves, and in some places the earth was cracked. The shock lasted for about thirty seconds, during which time the Indians were wild with fright. A number of them ran to the church and crowded in. Since that time there have been about twenty different shocks, the last one being on April 12, although none was nearly so severe as the first. A very slight shock was felt at Skeena.

Dr. David P. Todd, writing to the *Nation* from the U.S.S. *Pensacola*, at Ascension, on March 16, refers in terms of high appreciation to the work done in meteorology by his colleague Prof. Abbe. A "nephoscope" was specially constructed for the Expedition on board the *Pensacola*. Prof. Abbe has elaborated a method for the use of this instrument in determining the actual height and velocity of clouds by combining observations made when the vessel or observer moves successively in two different directions, or with two different velocities; and he calls this the "aberration method," to distinguish it from ordinary parallax methods. His main work has been a determination of the motions of the atmosphere from a study of the lowest winds and the successive strata of clouds; and, to this end, he has maintained daily observations with the nephoscope at sea, and when possible on shore. The visible clouds, he concludes, give little or no information as to the motions of the atmosphere in the widest sense, but prove that the atmosphere is everywhere divided into local systems of currents, so that we have winds circling around a storm-centre, a high barometer, an ocean, or a continent; and, at least in the Atlantic, have no winds that circulate exactly as they would do on a rotating, uniform, smooth globe. The angles of inflow and outflow have been determined for three or four successive strata of air in mid-Atlantic; also the relations of the cloud-appearances to distant storms, squalls rains, and changes of wind, with such accuracy that on many occasions predictions of such phenomena have been made and verified.

Mr. S. H. C. Hutchinson, Meteorological Reporter for Western India, has written an excellent "Brief Sketch of the Meteorology of the Bombay Presidency in 1888-89." The meteorology of that year was characterized, Mr. Hutchinson says, by strongly marked deviations from the weather conditions of an average year. Of these, the most noteworthy were, a general rise of abnormal barometric pressure for a considerable period, a general deficiency of rainfall in September, and the scanty rainfall throughout the year. Mr. Hutchinson points out that all these variations are of much practical importance, and, from a scientific point of view, of considerable interest, inasmuch as they confirm the laws or principles deduced from the meteorological data of many past years. These laws or principles are, that the rainfall is deficient when barometric pressure is above the normal height, and excessive when the barometric pressure is lower than usual; that at or about the epochs of minimum solar spotted area, high abnormal barometric pressure movements make their appearance, and that at or about the epochs of maximum solar spotted area, abnormally low pressure movements take place in India and over greater part of the tropics; that cyclones are formed in the trough of a relatively minimum barometric pressure; and lastly, that the number of atmospheric disturbances is great at the epoch of minimum sunspots.

IN Dr. A. Petermann's *Mitteilungen* (Heft v., 1890), Dr. A. Supan gives some particulars respecting Emin Pasha's meteorological journal, which will shortly be published. The registers extend from August 1, 1881, to February 27, 1890, and, omitting the interruptions, contain observations for seven years and ten months. They are said to have been taken with great care, and may be divided into three periods: August 1, 1881, to April 24, 1885, at Ladó; July 13, 1885, to December 5, 1888, at Wadelai; and March 1 to December 4, 1889, during the march with Stanley to the coast. On the latter date Emin Pasha met with his serious accident, but so great was his desire to continue the observations, that he resumed them on January 5, 1890, in the German hospital at Bagamoyo. Dr. Supan regrets the non-publication of Mackay's observations at Rubaga (Uganda), which were sent to the Royal Geographical Society in 1886, as they promise to be the most important contribution to the climatology of the interior of tropical Africa.

A CHEAP bunsen burner is being sold by Messrs. John J. Griffin and Sons, which possesses many advantages over the ordinary burner, with central gas jet constructed so that the gas and the air may be simultaneously regulated. In the new patent burner the gas passes into the tube through a way cut in the side of the tube, which is therefore open from top to bottom. Such an arrangement is a considerable improvement, inasmuch as there is no jet to become choked. The burner can also be easily taken apart in order to clean the tube when corroded. To regulate the flow of gas under varying gas pressures small movable disks are provided, which, however, are little better for the purpose than the older method of rotating a cylinder concentric with that containing the air-inlets. Combinations are also made in which each burner can be regulated or extinguished separately, thus rendering them very suitable for combustion furnaces.

AN elaborate Report on the Natal forests, by Mr. H. G. Fourcade, has just been issued. He arrives at the following conclusions:—(1) The Natal forests, more particularly the timber forests, are well worth preserving, whether from an economic or climatic point of view, and the Government alone is competent to undertake the work. (2) The condition of the forests is, for the most part, lamentable, and the result of past abuses; their destruction is proceeding apace, and the following measures are recommended to insure their preservation and utilization to the best advantage: (*a*) The survey and demarkation of the principal forests. (*b*) Their protection from fires, from depredations, from destruction by natives or cattle, by means of suitable measures, such as the clearing of fire-belts, the establishment of small wattle plantations, the prohibition of wattle-cutting and cattle-grazing, with the aid of proper supervision and special legislation. (*c*) The closure of the forests pending survey, demarkation, and settlement. (*d*) The adoption of sound methods of forestry to secure a steady yield, improvement of the forest, and most profitable management. (*e*) The utilization of colonial woods for railway sleepers. (3) Plantations of conifers and hard woods, designed to supply the future requirements of the country, can be made profitably along railway lines in the upland and the midland districts. (4) The most urgent work of a Forest Department in Natal would be to save what is left of the native forests, and plantation work should be deferred till it can be undertaken without detriment to the progress of survey and demarkation.

IN the new number of the *Zoologist* there are some interesting notes, by Mr. R. J. Ussher, on crossbills in the county of Waterford. This spring he has had exceptionally good opportunities of observing the breeding habits of these birds, as four of their nests were found in his neighbourhood, three of them being within fifteen hundred yards of his house. Of the four male birds, three were red, or red interspersed with brown. One had yellow plumage, similar to that of a specimen which Mr. Ussher presented last year to the British Museum. This bird had all the appearance of having arrived at full maturity, being large, active, vigilant, and with mandibles conspicuously crossed. When Mr. Ussher climbed to the nest, both male and female perched within four feet of him, "calling excitedly." "On April 17," he says, "these crossbills were seen to carry bits of something in their mouths to the nest, as if to feed their young. The nature of the food has not been ascertained, but is suspected to be largely composed of the green opening buds of the larch, on which I have repeatedly seen the male feeding—*e.g.*, on April 4." Mr. Ussher thinks that crossbills are on the increase in Ireland at present.

IN the Journal of the Bombay Natural History Society (vol. iv. No. 3) Mr. E. Giles records a curious fact which ought to have some interest for entomologists. In June 1888 he was standing one morning in the porch of his house, when his attention was attracted by a large dragon-fly of a metallic blue colour, about 2½ inches long, and with an extremely neat figure, who was cruising backwards and forwards in the porch in an earnest manner that seemed to show he had some special object in view. Suddenly he alighted at the entrance of a small hole in the gravel, and began to dig vigorously, sending the dust in small showers behind him. "I watched him," says Mr. Giles, "with great attention, and, after the lapse of about half a minute, when the dragon-fly was head and shoulders down the hole, a large and very fat cricket emerged like a bolted rabbit, and sprang several feet into the air. Then ensued a brisk contest of bounds and darts, the cricket springing from side to side and up and down, and the dragon-fly darting at him the moment he alighted. It was long odds on the dragon-fly, for the cricket was too fat to last, and his springs became slower and lower, till at last his enemy succeeded in pinning him by the neck. The dragon-fly appeared to bite the cricket, who, after a struggle or two, turned over on his back and lay motionless, either dead, or temporarily senseless. The dragon-fly then, without any hesitation, seized him by the hind legs, dragged him rapidly to the hole out of which he had dug him, entered himself, and pulled the cricket in after him, and then, emerging, scratched some sand over the hole and flew away. Time for the whole transaction, say, three minutes."

A CATALOGUE of the Birds in the Provincial Museum, N.W.P. and Oudh, Lucknow, has been printed by order of the Museum Committee. Like the previous catalogue, it records the purely Indian birds in the Museum, now 783 in number, represented by 5360 specimens. Mr. George Reid, who is in honorary charge of the natural history department of the Museum, says no pains have been spared to make the work both accurate and complete. "It contains, he believes, in a convenient form, all the information requisite to enable workers at a distance to avail themselves, if necessary, of the contents of the Museum; while it places in the hands of all an absolutely trustworthy record of localities for a considerable number of species, and so contributes to an accurate knowledge of their geographical distribution, which, after all, is, or ought to be, the primary object of all local catalogues."

Mr. L. Fletcher, F.R.S., contributes to the current number of the *Mineralogical Magazine* a valuable paper on the meteoric iron of Tucson. The other contents of the number, in addition to abstracts and a review, are:—The hemimorphism of stephanite: the crystalline form of kaolinite, by H. A. Miers; on zinc oxide from a blast-furnace, by J. Tudor Cundall; on zinc sulphide replacing stibnite and orpiment—analyses of stephanite and polybasite, by G. T. Prior; index to mineralogical and petrographical papers, by H. A. Miers.

The Marine Biological Association of the United Kingdom has issued the third number of its Journal, and we need scarcely say that the papers present a record of much valuable work. The following are the contents:—The Director's Report, No. 3; the sense-organs and perceptions of fishes, with remarks on the supply of bait, by W. Bateson (with plate); notes on oyster culture, by Dr. G. Herbert Fowler (with plate); the generative organs of the oyster, by Dr. P. P. C. Hoek—abstract by G. C. Bourne (with plates); letter on oyster culture, by Lord Montagu of Beaulieu; flora of Plymouth Sound and adjacent waters (preliminary paper), by T. Johnson (with a woodcut); report of a trawling cruise in H.M.S. *Research* off the south-west coast of Ireland, by Gilbert C. Bourne; notes on the Echinoderms collected by Mr. Bourne in deep water off the south-west coast of Ireland in H.M.S. *Research*, by Prof. F. Jeffrey Bell; anchovies in the English Channel, by J. T. Cunningham (with an illustration in the text); notes and memoranda (with plate); and price list of specimens. In his Report, Mr. G. C. Bourne mentions that Dr. Dohrn, the founder and Director of the Naples Zoological Station, writing to Prof. Ray Lankester about the choice of a site for the laboratory of the Marine Biological Association, said that the source from which the sea-water was derived was not of so much importance as the size of the storage reservoirs, for no water that could be drawn from the sea would be as suitable for hatching and rearing delicate marine organisms as that which had been for some time in the reservoirs. "Our experience," says Mr. Bourne, "proves the wisdom of Dr. Dohrn's advice."

Messrs. Friedländer and Son, Berlin, have issued two numbers of *Abhandlungen und Berichte* of the Zoological and Anthropological Museum of Dresden. The first number includes an elaborate report, for the year 1887, of the ornithological stations in the Kingdom of Saxony, by A. B. Meyer and F. Helm; a paper on *Sus celebensis*, by A. Nehring; Lung Ch'üan-Yao, or old Celadon porcelain, by A. B. Meyer; Coleoptera collected in the years 1868–77 during a journey in South America by A. Stübel, arranged by T. Kirsch; and an obituary notice of T. Kirsch, by A. B. Meyer. The second number consists of a monograph, by Dr. K. M. Heller, on "Der Urbüffel von Celébes: *Anoa depressicornis* (H. Smith)." Both numbers are admirably printed and illustrated.

Messrs. William Wesley and Son have issued No. 100 of their "Natural History and Scientific Book Circular." It contains a list of works relating to entomology and botany.

Messrs. Joseph Torrey, Jun., and Edwin H. Barbour, in a letter dated Iowa College, Grinnell, May 9, have sent to *Science* an account of a remarkable meteor, or meteoric shower, which passed over the State of Iowa on Friday, May 2, at 5.40 p.m. In spite of the brightness of the sun, shining at the time in a nearly cloudless sky, the light of the meteor was very noticeable. Its great size, powerful illumination, discharge of sparks, comet-like tail 3° to 5° in length, and the great train of smoke which marked its course for fully ten minutes after its passage, made a strong and lasting impression on the minds of all who saw it. Unfortunately the clamour over an exciting game of ball prevented the many members of the college who saw it from making as careful observations as they would otherwise have done; so it was impossible to tell whether its passage was accompanied by sound or not, but farmers in the neighbourhood report a faint hissing noise. It appeared to enter the atmosphere about 20° to 30° south of the zenith, and descending at an angle of about 50° to 60°, passed below the horizon north-north-west of Grinnell. By telegraphing, one small meteorite, weighing one-fifth of a pound, and several fragments from a 70-pound one, were secured, and analyses and microscopic sections at once made. They contain a large amount of metal for the "stone" class of meteorites. The following is the analysis of the matrix of the 70-pound meteorite: silica, 47·03; iron oxide, 29·43; oxide aluminium, 2·94; lime, 17·58; magnesia, 2·96; total, 99·94.

Mr. George F. Kunz, writing to *Science* from New York on May 8 about the same meteor, says it was seen over a good part of the State of Iowa at 5.15 p.m., standard western time. According to his account, the passage of the meteor was accompanied by a noise like that of heavy cannonading or thunder; and many people rushed to the doors, thinking it was the rumbling of an earthquake. The meteor exploded, he says, about eleven miles north of Forest City, Winnebago County, in the centre of the northern part of Iowa, lat. 43° 15′, long. 93° 45′ west of Greenwich, near the Minnesota State line. The fragments were scattered over a considerable surface of ground, and a part of the main mass was believed to have passed down into Minnesota. Up to the time at which Mr. Kunz wrote his letter, there had been found masses of 104 pounds, 70 pounds, and 10 pounds, and a number of fragments weighing from one to twenty ounces each. The pieces are all angular, with rounded edges. Mr. Kunz says the meteor is apparently of the type of the Parnallite group of Meunier, which fell February 28, 1857, at Parnallee, India. "The stone is porous, and when it is placed in water to ascertain its specific gravity, there is a considerable ebullition of air. The specific gravity, on a fifteen-gramme piece, was found to be 3·638. The crust is rather thin, opaque black, not shining, and, under the microscope, is very scorious, resembling the Knyahinya (Hungary) and the West Liberty (Iowa) meteoric stones. A broken surface shows the interior colour to be gray, spotted with brown, black, and white; the latter showing the existence of small specks of meteoric iron from one-tenth to four-tenths of a millimetre across. Troilite is also present in small rounded masses of about the same size. On one broken surface was a very thin seam of a soft black substance, evidently graphite (?), and soft enough to mark white paper; a felspar (anorthite ?) was also observed, and enstatite was also present." Mr. Kunz points out that this is the fourth meteorite that has been seen to fall in Iowa. The other three falls were as follows: at Hartford, Linn County, February 25, 1847; at West Liberty, Iowa County, February 12, 1875; and the great fall of siderolites at Estherville, Emmet County, May 10, 1879, which fall comprised over two thousand pieces weighing from a tenth of an ounce to 400 pounds.

A valuable contribution to the study of the natural causes which check the tendency of plants and animals to increase in too great numbers appears in a recent issue of the *Bulletin* of the Moscow Naturalists (1889, No. 3). It is by Mr. Alexander Becker, whose ideas on the subject are based upon direct observation. For several years, various species of grasshoppers appeared in great quantities in South-East Russia (about Sarepta), but then came one year of sudden death for most of them: they were seen sitting motionless on the grasses, and dying. A few years ago the butterfly, *Melithæa Phœbe*, var. *ætherea*, appeared in immense numbers, and it was expected that in the following year it would be still more numerous, but in reality it became exceedingly rare. The like was true of *Zegris eupheme*, which suddenly became most numerous in 1883, and disappeared in 1884; even in 1883 its caterpillars could hardly be found on the plants they usually feed upon. Some hostile influence had prevented its further multiplication. Similar facts have been observed in the case of Mammalia as well. The *Spermophilus citillus* is usually met with about Sarepta; but sixty years ago it suddenly disappeared in the course of one summer—probably succumbing to some contagious disease. During the following years it could hardly be found, but by and by it multiplied again to such an extent that each inhabitant of Sarepta had to undertake to kill every year a certain number of the *Spermophilus*. Their numbers were diminished, but still they are very numerous in the steppes, thus illustrating the small importance of even a systematic attempt at extermination, as compared with the importance of natural checks. Many birds suddenly appear in great numbers, and as suddenly disappear. The *Merula rosea* for several years nested in very great numbers at Sarepta. Mr. Becker also mentions interesting facts as to a yellow dust which spread over Saratoff in April 1864, and must have been brought from Central Asia. Under microscopical examination, it was found to contain a great number of germs and Infusoria. The seeds of *Typha stenophylla*, which formerly was never found at Sarepta, must have been imported quite recently by wind, either from Caucasia or Siberia. In the course of one summer this pretty plant became numerous in a pond in the Ergheni Hills, but it disappeared next year. As a rule, a decrease of all kinds of insects is noticed about Sarepta, and it can be explained only by the general conditions of weather resulting in indifferent crops, and a general diminution of hay-crops in the surrounding steppes.

A COMPREHENSIVE paper upon the simpler derivatives of hydroxylamine, NH_2OH, by Drs. Behrend and Leuchs, will be found in the current number of *Liebig's Annalen* (p. 203). The great interest with which hydroxylamine derivatives have recently been invested by the discovery among them of geometrical isomers, and the considerable importance of hydroxylamine as a reagent for investigating the constitution of organic compounds, rendered it very desirable that something more definite should be ascertained regarding the compounds obtained by replacing the hydrogen of hydroxylamine by simple organic radicles, than the few isolated facts hitherto acquired. There are five types of derivatives possible, which are classified as follows, R representing a monad radicle: $H_2N—OR$ α-monalkyl, $RHN—OH$ β-monalkyl, $RHN—OR$ α-dialkyl. $R_2N—OH$ β-dialkyl, and $R_2N—OR$ trialkyl hydroxylamine. In the case of the radicle benzyl, $C_6H_5—CH_2—$, a complete series of such compounds have been prepared and fully investigated. The first member of the series, α-benzylhydroxylamine, $H_2N—OC_7H_7$, was prepared some time ago by Janny, and Drs. Behrend and Leuchs utilized Janny's reaction, improved very considerably in its details, in order to prepare this substance in quantity. The reaction consists in warming hydrochloric acid with the benzyl derivative of the well-known acetone compound of hydroxylamine, acetoxin, $(CH_3)_2C{=}NOH$. Its course may be represented by the equation $(CH_3)_2C{=}NOC_7H_7 + HCl + H_2O = H_2N—OC_7H_7 . HCl + (CH_3)_2CO$. The hydrochloride thus obtained crystallizes in large, flexible, lustrous plates, which sublime at 230°–260° C. without fusion. The free base itself, α-benzylhydroxylamine, $H_2N—OC_7H_7$, is a liquid which cannot be distilled at the ordinary pressure without decomposition, but at a pressure of 30 mm. distils unchanged at 118°–119°. It may also be safely distilled in steam. α-dibenzylhydroxylamine, $H(C_7H_7)N—O(C_7H_7)$, is readily obtained from the mono-compound just described by the limited action of benzyl chloride. It is also liquid at the ordinary temperature, and more difficultly volatilizable even in steam than the mono-compound. Its hydrochloride crystallizes well from alcohol in glittering needles. The di-compound is readily transformed by further action of benzylchloride into tribenzylhydroxylamine, $(C_7H_7)_2N—OC_7H_7$. The tri-compound is likewise a liquid, and is not volatile without decomposition even *in vacuo*. Its hydrochloride is readily and completely decomposed by water. The β-mono-compound, $(C_7H_7)HN—OH$, is obtained by boiling the α-di-compound with concentrated hydrochloric acid, or heating the two together in a sealed tube to 130°. $(C_7H_7)HN—O(C_7H_7) . HCl + HCl = C_7H_7HN—OH . HCl + C_7H_7Cl$. The free base, which is liberated as an oil upon addition of sodium carbonate solution to the concentrated solution of the hydrochloride, crystallizes on standing, and gives well-developed crystals on recrystallization from petroleum-ether. It also reduces Fehling's solution, in these two points differing markedly from the liquid α-mono-compound. The β-di-compound is best obtained by boiling hydroxylamine hydrochloride, benzyl chloride, and soda crystals with alcohol for an hour, using a reflux condenser. On cooling, crystals of the solid base are deposited, which melt at 123°. The preparation of this complete series shows in a very striking manner the different effects of substituting alkyl radicles for the hydrogen attached to nitrogen or for the hydroxylic hydrogen. The α-compounds are both liquids, while the β-derivatives are solids. The alkyl radicle replacing hydroxylic hydrogen is also very much more easily detached by the action of hydrochloric acid than that attached to nitrogen. It is also interesting to note that the basic character of hydroxylamine diminishes with the number of alkyl radicle groups introduced.

THE additions to the Zoological Society's Gardens during the past week include a Masked Parrakeet (*Pyrrhulopsis personata*) from the Fiji Islands, presented by Mr. Geo. Lawson; a Lanner Falcon (*Falco lanarius*), European, presented by Miss Marjorie Barnard; three Common Vipers (*Vipera berus*), British, presented by Mr. A. W. Cotton; two Andaman Starlings (*Sturnia andamanensis*) from the Andaman Islands, three Ceylon Fish-Owls (*Ketupa ceylonensis*) from Ceylon, six Tufted Ducks (*Fuligula cristata* 3 ♂ 3 ♀), European, purchased; a Great Bustard (*Otis tarda* ♀), European, received in exchange; two Japanese Deer (*Cervus sika* ♂ ♂), two Barbary Wild Sheep (*Ovis tragelaphus* ♂ ♀), a Burrhel Wild Sheep (*Ovis burrhel*, ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on June 5 = 14h. 57m. 6s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G.C. 4045	—	—	15 0 54	+ 2 2
(2) G.C. 4058	—	—	15 3 24	+56 11
(3) 342 Birm.	4·5	Reddish-yellow.	14 55 50	+66 22
(4) ν_1 Serpentis	5	Reddish-yellow.	15 20 41	+15 49
(5) μ Virginis	4	Whitish-yellow.	14 37 18	− 4 49
(6) R Ursæ Majoris ...	Var.	Reddish.	10 36 51	+69 21

Remarks.

(1) The spectrum of this nebula has not been recorded. In the General Catalogue it is described as: "Very bright; pretty large; round; pretty suddenly much brighter in the middle to a nucleus; following of two." The companion is apparently very faint.

(2) This is a bright oval nebula under the body of Draco. Smyth states that it is "rather faint at the edges, but not so as to obscure the form." The General Catalogue description is "Very bright; considerably large; pretty much extended in the direction 146°; gradually brighter in the middle." In 1848